

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ALFRED HENNEMANN
and MANFRED KIESER

Appeal No. 1998-3320
Application 08/417,017

ON BRIEF

Before WARREN, OWENS and PAWLIKOWSKI, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the examiner's final rejection of claims 1-20, which are all of the claims in the application.

THE INVENTION

The appellants' claimed invention is directed toward a surface modified pigment. Claims 1 and 13 are illustrative:

1. A surface-modified pigment comprising a conductive

pigment partially coated by reaction with an organic modifying agent in an amount such that the powder electrical conductance of the surface-modified pigment is 80% or less of the powder electrical conductance of the uncoated conductive pigment but not less than 10^{-7} S.^[1]

13. The pigment prepared by:

mixing a conductive pigment with an organic modifying agent, optionally mixed with a solvent, removing the volatile reaction products and any solvent, agitating and heating to about 100EC or more, and drying the resulting surface-modified pigment partially coated by the organic modifying agent.

THE REFERENCES

Tsunaga et al. (Tsunaga)	4,888,135	Dec. 19,
1989		
Maeda et al. (Maeda)	5,185,228	Feb. 9,
1993		
Baigrie et al. (Baigrie)	5,382,384	Jan. 17,
1995		
Sato et al. (EP '557)	0 139 557	May 2,
1985		
(European patent application)		

THE REJECTIONS

The claims stand rejected under 35 U.S.C. § 103 as follows: claims 1-13 over Tsunaga in view of EP '557 and Maeda, and claims 14-20 over these references further in view of Baigrie.

¹ "S" stands for "siemens" which is reciprocal ohms (specification, page 3, lines 17).

OPINION

We affirm the rejection of all claims except claim 15.

The appellants state that the claims stand or fall in the following groups: 1) claims 1-13, 2) claims 14, 16 and 17, 3) claim 15 and 4) claims 18-20 (brief, page 3). We therefore limit our discussion to one claim in each group, i.e., claims 1, 14, 15 and 18. *See In re Ochiai*, 71 F.3d 1565, 1566 n.2, 37 USPQ2d 1127, 1129 n.2 (Fed. Cir. 1995); 37 CFR § 1.192(c)(7)(1997).

Rejection of claims 1-13

Tsunaga discloses "an electrical conductive powder consisting of copper particles, a silver coating material coating a part or the total of the surface of the copper particles and a titanate coupling agent combined to the copper particles and/or the silver coating material" (col. 2, lines 5-10).² Because the appellants' conductive pigment can be metallic powders (specification, page 3, lines 28-30) and Tsunaga's copper particles preferably have a mean diameter of 2-15 Fm (col. 2, lines 19-21), which is within the appellants'

² The appellants' organic modifying agent can be a titanate (specification, page 5, lines 3-11).

exemplified pigment particle size range of less than 15 Fm (specification, examples 1-6), it reasonably appears that Tsunaga's particles can function as conductive pigment particles.

Tsunaga's teaching that the copper particles can be partly coated with the silver material and that the titanate coupling agent can be combined to the copper particles and/or the silver material (col. 2, lines 6-10; col. 3, lines 31-36) indicates that the titanate coupling agent can be reacted with the silver portion of the conductive particles without being reacted with the copper portion and, therefore, can partly coat the conductive particles.

Tsunaga does not state that the electrical conductance of the surface modified particles can be 80% or less than that of the uncoated particles. However, a comparison of Tsunaga's comparative example 3, wherein no titanate coupling agent is used, and examples 3 and 4, wherein, respectively, 0.1 wt% and 0.5 wt% titanate coupling agent are used, other variables in comparative example 3 and examples 3 and 4 being the same, shows that the addition of the titanate coupling agent to particles increased the cured film primary stage specific

resistance, which is inversely related to conductance, by 20% or more, and that the use of 0.5 wt% titanate increased the specific resistance much more than did the use of 0.1 wt% titanate. In neither example does the conductance appear to be reduced below 10^{-7} S. Thus, Tsunaga would have fairly suggested, to one of ordinary skill in the art, use of an amount of titanate which decreases the conductance of the particles to a value which is at least 20% below that of particles having no titanate but which does not reduce the conductance below 10^{-7} S.

The appellants argue that Tsunaga teaches that the silver may partially coat the copper particles, but does not teach that the particles may be partially coated with the titanate coupling agent (brief, page 4). Tsunaga's teaching that the silver material may partially coat the copper particles and that the titanate coupling agent may be combined to the silver without being combined to the copper (col. 2, lines 3-10; col. 3, lines 31-36) indicates that the titanate coupling agent can coat the portion of the copper particles coated by the silver without coating the portion which is not coated by the silver and, therefore, can partially coat the copper/silver

conductive particles.

The appellant argues that Tsunaga provides no teaching which would have suggested to one of ordinary skill in the art that coating the copper particles with silver and the titanate coupling agent would reduce the conductance of the pigment to 80% or less of the original conductance (brief, page 4). Tsunaga's silver coated copper particles fall within the scope of the appellants' term "conductive pigment". A comparison of Tsunaga's comparative example 3 and examples 3 and 4, as discussed above, shows that use of a titanate reduced the conductance to 80% or less of the conductance of silver coated copper particles having no titanate.

The appellants argue that Tsunaga's powder is intended to be of high electrical conductance (brief, page 5). Tsunaga states that the particles are to have good or high conductivity (col. 1, line 53; col. 2, lines 55-56). However, Tsunaga's examples 3 and 4 indicate that the terms "high conductivity" and "good conductivity" include conductivities which are reduced 20% or more compared to the conductivities of particles having no titanate (comparative example 3).

For the above reasons we conclude that the pigment

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recited in the appellants' claim 1 would have been obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103. Accordingly, we affirm the rejection of claims 1-13.

Rejection of claim 14

The conductive pigment compositions recited in claim 14 include "metallic powders", and this term encompasses the copper/silver particles of Tsunaga (col. 2, lines 4-10). Hence, we affirm the rejection of claim 14.

Rejection of claim 15

Claim 15 requires that the conductive pigment comprises a material selected from a Markush group which does not include metals. Tsunaga's disclosure is directed toward solving the problem of oxidation of copper, and his approach is to coat the copper partially or totally with silver (col. 1, lines 22-23 and 50-52, and 64-67). The examiner relies upon Baigrie, who discloses a conductive polymer composition comprising an essentially amorphous thermoplastic resin, a thermosetting resin and a conductive filler (col. 2, lines 11-17). The examiner argues that because Baigrie's disclosed fillers include copper, silver, and some of the materials recited in the appellants' claim 15, Baigrie provides a teaching that all of these materials are functional equivalents (answer, page 5). Baigrie may indicate that all of these materials are functional equivalents in his composition. However, the examiner has not explained why, considering that Tsunaga's disclosure is specific to copper particles coated partly or totally with the silver material, Tsunaga and Baigrie would have led one of ordinary skill in the art to substitute one of

Baigrie's other materials for the copper or the silver material in Tsunaga's composition, or to add one of these other materials to Tsunaga's composition. Consequently, we reverse the rejection of claim 15.

Rejection of claim 18

Claim 18 requires that a composition containing the surface modified pigment includes not more than 40 wt% of the surface modified pigment. Tsunaga teaches that the proportion of the conductive powder in an electrically conductive composition "may be chosen from [a] rather broad range in accordance with the use of the electrically conductive composition", and preferably is 100 parts by weight of electrically conductive powder to 5-50 parts by weight, more preferably 25 to 40 parts by weight, of the solid content of the binder resin (col. 4, lines 1-10). Thus, the lowest amount of electrically conductive powder preferred by Tsunaga is 100 parts by weight of powder per 50 parts by weight of solids in the binder resin, i.e., the powder is 67 wt% of the composition based upon the powder and the solids in the binder. The appellants' claim 18, however, encompasses

percentages of conductive powder based not only on the solids in the binder but also upon the total binder. Such percentages would be considerably below 67% in compositions which include a large amount of volatile material in the binder resin, such as Tsunaga's exemplified binder resin which is 60 wt% solids (col. 4, lines 27-28). Moreover, the teaching that the proportion of electrically conductive powder can be chosen from a rather broad range would have indicated to one of ordinary skill in the art that proportions which are above or below the preferred range to a considerable degree would be suitable, such as 40 wt%. Hence, we are not persuaded by the appellants' argument that Tsunaga is limited to compositions which contain at least 67 wt% electrically conductive powder (brief, page 10). Accordingly, we affirm the rejection of claim 18 and claims 19 and 20 which stand or fall therewith.

DECISION

The rejections under 35 U.S.C. § 103 of claims 1-13 over Tsunaga in view of EP '557 and Maeda, and claims 14 and 16-20 over these references further in view of Baigrie, are

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affirmed. The rejection under 35 U.S.C. § 103 of claim 15
over Tsunaga in view of EP '557, Maeda and Baigrie is
reversed.

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No time period for taking any subsequent action in
connec- tion with this appeal may be extended under 37 CFR §
1.136(a).

AFFIRMED-IN-PART

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CHARLES F. WARREN)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
TERRY J. OWENS))
Administrative Patent Judge)	APPEALS AND
)	
)	INTERFERENCES
)	
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